Ahmad Omar Ahsan

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Education

Master of Science | **Biomedical Engineering (Specialization: Medical Imaging)** Jan. 2024 – Present
University of Calgary, Calgary, AB, Canada

- Relevant coursework: Medical Imaging Techniques, Advanced Medical Image Processing

Bachelor of Science | **Computer Science and Engineering** Jan. 2017 – March 2021
Islamic University of Technology, Gazipur, Bangladesh

- Relevant coursework: Linear Algebra, Data Structures, Machine Learning, Pattern Recognition.

Work Experience

AI Engineer Feb 2021 – June 2022
Intelligent Machines Dhaka, Bangladesh

- Developed keyword transformer using TensorFlow for keyword classification. This model was developed to classify keywords spoken in different Bengali dialects to detect keywords spoken in sales pitches.
- Trained and deployed a text detection and recognition model using PyTorch for text classification and localization. This model was developed to extract information from handwritten receipts from local markets.

AI Intern Nov 2019 – Jan 2021
Intelligent Machines Dhaka, Bangladesh

- Fine-tuned Efficient-Det to detect point of sales material in the image. The model enabled the client to check how many point-of-sales materials were deployed in the market.
- Created scripts to optimize data generation, training, and testing for deep learning models.

Research experience

Research fellow Jun 2022 - Feb 2023
Hyperbolic Deep Learning for Computer Vision | Fatima Fellowship

- Hyperbolic image classification using hyperbolic graphs, hyperbolic transformers, and hyperbolic MLP.
- Generative heat modeling for MRI generation from latent codes.

Research contributor Nov 2020 - June 2021
Sound Generation Group | Sound of AI

- Worked as a research contributor in one of the largest open-source research projects.
- Developed and trained a WaveNet-based encoder for sound generation.
- Carried out a literature review of different sound generation modules.

Publications

- Ahmad O. Ahsan, Christopher Nielsen, Nils D. Forkert, Matthias Wilms: **A diffusion model-based self-explainable classifier for retinal image analysis** SPIE Medical Imaging 2025, San Diego, USA.
- Zaid Mahboob, Ahmad O. Ahsan and Matthias Wilms . **Using an Adult Retinal Image Analysis Foundation Model for Retinopathy of Prematurity Staging - Are There Benefits?** SPIE Medical Imaging 2025, San Diego, USA.
- Matthias Wilms, Ahmad O. Ahsan, Erik Y. Ohara, Gabrielle Dagasso, Elizabeth Macavoy, Emma A.M. Stanley, Vibujithan Vigneshwaran, and Nils D. Forkert. **A Lightweight 3D Conditional Diffusion Model for Self-Explainable Brain Age Prediction in Adults and Children.** MICCAI 2024 Workshop Machine Learning in Clinical Neuroimaging.
- Christopher Nielsen, Ahmad O. Ahsan, Matthias Wilms and Nils D. Forkert (2024). **A novel multimodal deep learning fusion framework for predicting neovascular activity evolution in exudative age-related macular degeneration.** MICCAI 2024 Mario workshop.

- Ahsan AO, Tang S, Peng W. **Efficient Hyperbolic Perceptron for Image Classification**. Electronics. 2023; 12(19):4027. [Paper] [Code]
- MM Morshed*, AO Ahsan*. **Attention-Free Keyword Spotting**. ICLR 22 PML4DC workshop. [Paper][Code]

ACHIEVEMENTS

Hear Challenge 2021, NeurIPS 2021 Oct 2021

HEAR evaluates audio representations using a benchmark suite across a variety of audio domains.

- 1st place: Speech Commands Full, Speech Commands 5H, Mridingham Tonic
- 3rd place: Mridingham Stroke, Beehive States

*Equal contribution